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cals that are effective are traces of illuminating gas and tobacco smoke; considerable concentrations of CO<sub>2</sub> (4-50 per cent); high partial pressures of ether and chloroform vapors; and HCl gas. Other effective stimuli are high temperatures, shaking, sprinkling with dust, and wounding the style. FITTING concludes that the process is a vital one, for it does not occur when the plant is in heat rigor or in rigor from lack of oxygen. He also concludes that it is a true stimulus process, showing well-marked presentation and reaction times, as well as typical summation and relaxation. The reaction cannot be attributed to general inhibitory and acceleration effects upon the flowering process, but is a direct stimulatory effect upon the petals. The reaction time varies greatly with the stimulus, age of flower, and species of flower. Traces of illuminating gas give a reaction only after 2-6 hours, while CO<sub>2</sub> in optimum concentration gave a reaction after 30 seconds in *Verbascum thapsiforme*, and after only a slightly longer period in a number of other forms. Reactions to shaking and high temperatures were also rapid. Old flowers were always more sensitive than young ones.

FITTING proposes to call these responses *chorisms*, using the prefixes chemo-, thermo-, seismo-, etc. The paper should prove of considerable economic interest.—WILLIAM CROCKER.

**Fundamental units of vegetation.**—Ecology as a definite branch of the science of botany, while still in its infancy, has reached a stage in its development at which it is instructive to take an occasional retrospective glance in order to inquire what were the beginnings from which the branch has developed and whether there are tendencies which require pruning or molding. Moss<sup>9</sup> has taken such a backward look over the course of the development of the concepts and the nomenclature of the units of vegetation most used in the study of plant communities. The look has been a careful one, and has traced "plant associations" from its first use in a floristic sense by HUMBOLDT, in 1806, and with its truer ecological meaning by SCHOUW, in 1822, to the present day. To Moss the concept seems to be best defined as "a community of definite floristic composition within a formation."

He finds "plant formation" a term and concept of slightly more recent origin, dating to its employment by GRISEBACH in 1838. The different meanings this term has had for various workers are discussed in such a manner as seems likely to lead to some agreement as to its proper content. The desirability of some general agreement as to methods of denoting associations and formations is discussed in a most reasonable manner, and several good suggestions made. The writer is to be commended for correctness of perspective and breadth of view throughout what is doubtless the best historical review of this phase of botany which has yet appeared.—GEO. D. FULLER.

<sup>9</sup> Moss, C. E., The fundamental units of vegetation. *New Phytol.* 9:18-53. 1910.